

## Substitute\_SequenceListing

<110> SUNG, Young Chul  
YOUN, Jin-Won  
YANG, Se-Hwan  
PARK, Su-Hwan  
LEE, Chang Geun

<120> A vaccine enhancing the protective immunity to Hepatitis C virus  
using plasmid DNA and recombinant adenovirus

<130> 428.1049

<140> 10/528,644  
<141> 2005-03-18

<150> KR 2002-58712  
<151> 2002-09-27

<150> KR 2002-68496  
<151> 2002-11-06

<160> 184

<170> PatentIn version 3.5

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ggtgtgcgcg cgacttaggaa gacttccgag cggtcgcaac ctcgtggaag gcgacagcct 180  
atcccccaagg ctcgccaacc cgagggttagg acctgggctc agcccggtta cccttggccc 240  
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### Substitute\_SequenceListing

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gcggagatcc	tgcggagatc	taggaagttc	cccgacgca	tgcctatcg	ggcacgccc	960
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caccacaata	ttgtgtacgc	cacaacatcc	gcgagcgaa	gtctgcggca	gaagaaggtc	1500
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Substitute\_SequenceListing

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Substitute\_SequenceListing

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Substitute\_SequenceListing

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Substitute\_SequenceListing

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<223> HCV53-72

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Ser Glu Arg Ser Gln Pro Arg Gly Arg Arg Gln Pro Ile Pro Lys Ala  
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Substitute\_SequenceListing  
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Arg Gln Pro Glu  
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Pro Gly Tyr Pro  
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<400> 58

Gly Arg Thr Trp Ala Gln Pro Gly Tyr Pro Trp Pro Leu Tyr Gly Asn  
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Glu Gly Leu Gly  
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<210> 59  
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<400> 59

Trp Pro Leu Tyr Gly Asn Glu Gly Leu Gly Trp Ala Gly Trp Leu Leu  
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Ser Pro Arg Gly  
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Substitute\_SequenceListing

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Pro Thr Asp Pro  
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<400> 61

Ser Arg Pro Ser Trp Gly Pro Thr Asp Pro Arg Arg Arg Ser Arg Asn  
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Leu Gly Lys Val  
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<210> 62  
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Arg Arg Arg Ser Arg Asn Leu Gly Lys Val Ile Asp Thr Leu Thr Cys  
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Gly Phe Ala Asp  
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<210> 63  
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<400> 63

Ile Asp Thr Leu Thr Cys Gly Phe Ala Asp Leu Met Gly Tyr Ile Pro  
Page 20

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Substitute\_SequenceListing  
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Arg Ala Leu Ala  
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<400> 65

Pro Leu Gly Gly Val Ala Arg Ala Leu Ala His Gly Val Arg Leu Leu  
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Glu Asp Gly Val  
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<400> 66

His Gly Val Arg Leu Leu Glu Asp Gly Val Asn Tyr Ala Thr Gly Asn  
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Leu Pro Gly Cys  
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<210> 67  
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Substitute\_SequenceListing

<212> PRT  
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<400> 67

Ser Thr Arg Val Thr Gly Gly Thr Glu Gly Arg Thr Thr Asn Arg Phe  
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Val Ser Ile Phe  
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Ala Ser Gly Pro Ser Gln Lys Ile Gln Leu Val Asn Asn Asn Gly Ser  
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Trp His Ile Asn  
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<400> 69

Val Asn Asn Asn Gly Ser Trp His Ile Asn Arg Thr Ala Leu Asn Cys  
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Asn Asp Ser Leu  
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<400> 70

Arg Thr Ala Leu Asn Cys Asn Asp Ser Leu Ser Ser Gly Phe Ile Ala  
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Substitute\_SequenceListing  
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Ala Leu Phe Tyr  
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<210> 71  
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<212> PRT  
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<400> 71

Ser Ser Gly Phe Ile Ala Ala Leu Phe Tyr Thr His Lys Phe Asp Ser  
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Ser Gly Cys Pro  
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<210> 72  
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<212> PRT  
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<400> 72

Thr His Lys Phe Asp Ser Ser Gly Cys Pro Glu Arg Met Ala Ser Cys  
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Arg Pro Ile Asp  
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<210> 73  
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<212> PRT  
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<223> HCV454-473

<400> 73

Glu Arg Met Ala Ser Cys Arg Pro Ile Asp Lys Phe Ala Gln Gly Trp  
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Gly Ser Ile Thr  
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<210> 74  
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Substitute\_SequenceListing

<212> PRT  
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<400> 74

Lys Phe Ala Gln Gly Trp Gly Ser Ile Thr Tyr Ala Glu Ser Gly Gly  
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Ser Asp Gln Arg  
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<210> 75  
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<400> 75

Tyr Ala Glu Ser Gly Gly Ser Asp Gln Arg Pro Tyr Cys Trp His Tyr  
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Ala Pro Arg Gln  
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<210> 76  
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<400> 76

Pro Tyr Cys Trp His Tyr Ala Pro Arg Gln Cys Gly Ile Val Pro Ala  
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Ser Gln Val Cys  
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<210> 77  
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<212> PRT  
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<220>  
<223> HCV494-513

<400> 77

Cys Gly Ile Val Pro Ala Ser Gln Val Cys Gly Pro Val Tyr Cys Phe  
Page 24

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Substitute\_SequenceListing  
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Thr Pro Ser Pro  
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<210> 78  
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<212> PRT  
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<220>  
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<400> 78

Gly Pro Val Tyr Cys Phe Thr Pro Ser Pro Val Val Val Gly Thr Thr  
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Asp Arg Ser Gly  
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<210> 79  
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<212> PRT  
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<400> 79

Val Val Val Gly Thr Thr Asp Arg Ser Gly Ala Pro Thr Tyr Thr Trp  
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Gly Glu Asn Glu  
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<400> 80

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Asn Asn Thr Arg  
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Substitute\_SequenceListing

<212> PRT  
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<400> 81

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Phe Gly Cys Thr  
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<400> 82

Pro Pro Gln Ala Asn Trp Phe Gly Cys Thr Trp Met Asn Ser Thr Gly  
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Phe Thr Lys Thr  
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<210> 83  
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<400> 83

Trp Met Asn Ser Thr Gly Phe Thr Lys Thr Cys Gly Gly Pro Pro Cys  
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Asp Ile Gly Gly  
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<400> 84

Cys Gly Gly Pro Pro Cys Asp Ile Gly Gly Val Gly Asn Asn Thr Leu  
Page 26

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Substitute\_SequenceListing  
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Thr Cys Pro Thr  
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Val Gly Asn Asn Thr Leu Thr Cys Pro Thr Asp Cys Phe Arg Lys His  
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Pro Glu Ala Thr  
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<400> 86

Asp Cys Phe Arg Lys His Pro Glu Ala Thr Tyr Thr Lys Cys Gly Ser  
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Gly Pro Trp Leu  
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Asp Tyr Pro Tyr  
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Substitute\_SequenceListing

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<400> 88

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Cys Thr Ile Asn  
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<400> 89

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Arg Met Tyr Val  
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<223> HCV624-643

<400> 90

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Leu Asp Ala Ala  
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<223> HCV634-653

<400> 91

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Page 28

1 5

Substitute\_SequenceListing 10 15

Glu Arg Cys Asp  
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<400> 93

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Thr Glu Trp Gln  
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<210> 94  
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<223> HCV664-683

<400> 94

Pro Leu Leu Leu Ser Thr Thr Glu Trp Gln Val Leu Pro Cys Ser Phe  
1 5 10 15

Thr Thr Leu Pro  
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<210> 95  
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Substitute\_SequenceListing

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<400> 95

Val Leu Pro Cys Ser Phe Thr Thr Leu Pro Ala Leu Ser Thr Gly Leu  
1 5 10 15

Ile His Leu His  
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<210> 96  
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<223> HCV684-703

<400> 96

Ala Leu Ser Thr Gly Leu Ile His Leu His Gln Asn Ile Val His Ala  
1 5 10 15

Gln His Leu His  
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<210> 97  
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<212> PRT  
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<223> HCV694-713

<400> 97

Gln Asn Ile Val His Ala Gln His Leu His Gly Val Gly Ser Ala Val  
1 5 10 15

Val Ser Ile Val  
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<210> 98  
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<213> Artificial Sequence

<220>  
<223> gHCV-1029

<400> 98

Ile Thr Ala Tyr Ser Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile  
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Substitute\_SequenceListing  
10 15

Thr Ser Leu Thr  
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<210> 99  
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<212> PRT  
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<400> 99

Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly Arg Asp Lys Asn Gln  
1 5 10 15

Val Glu Gly Glu  
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<210> 100  
<211> 19  
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<400> 100

Phe Leu Ala Thr Cys Val Asn Gly Ala Trp Thr Val Phe His Gly Ala  
1 5 10 15

Gly Ser Lys

<210> 101  
<211> 20  
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<400> 101

Trp Thr Val Phe His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys  
1 5 10 15

Gly Pro Ile Thr  
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<210> 102  
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Substitute\_SequenceListing

<212> PRT  
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<400> 102

Thr Leu Ala Gly Pro Lys Gly Pro Ile Thr Gln Met Tyr Thr Asn Val  
1 5 10 15

Asp Leu Asp Leu  
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<210> 103  
<211> 20  
<212> PRT  
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<400> 103

Gln Met Tyr Thr Asn Val Asp Leu Asp Leu Val Gly Trp Gln Ala Pro  
1 5 10 15

Pro Gly Ser Arg  
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<210> 104  
<211> 20  
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<400> 104

Val Gly Trp Gln Ala Pro Pro Gly Ser Arg Pro Leu Thr Pro Cys Thr  
1 5 10 15

Cys Gly Ser Ser  
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<210> 105  
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<400> 105

Pro Leu Thr Pro Cys Thr Cys Gly Ser Ser Asp Leu Tyr Leu Val Thr  
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Substitute\_SequenceListing  
10 15

Arg His Ala Asp  
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<210> 106  
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<212> PRT  
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<400> 106

Asp Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg  
1 5 10 15

Arg Gly Asp Ser  
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<210> 107  
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<220>  
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<400> 107

Val Ile Pro Val Arg Arg Arg Gly Asp Ser Arg Gly Ser Leu Pro Cys  
1 5 10 15

Pro Arg Pro Val  
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<210> 108  
<211> 20  
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<223> gHCV-1148

<400> 108

Arg Gly Ser Leu Pro Cys Pro Arg Pro Val Ser Tyr Leu Lys Gly Ser  
1 5 10 15

Ser Gly Gly Pro  
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<210> 109  
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Substitute\_SequenceListing

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<223> gHCV-1158

<400> 109

Ser Tyr Leu Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly  
1 5 10 15

His Ala Val Gly  
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<210> 110  
<211> 20  
<212> PRT  
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<223> gHCV-1168

<400> 110

Leu Leu Cys Pro Ser Gly His Ala Val Gly Ile Phe Arg Ala Ala Val  
1 5 10 15

Cys Thr Arg Gly  
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<210> 111  
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<212> PRT  
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<400> 111

Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val Asp  
1 5 10 15

Phe Ile Pro Val  
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<210> 112  
<211> 20  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> gHCV-1188

<400> 112

Val Ala Lys Ala Val Asp Phe Ile Pro Val Glu Ser Met Glu Thr Thr  
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Substitute\_SequenceListing  
10 15

Met Arg Ser Pro  
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<210> 113  
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<223> gHCV-1198

<400> 113

Glu Ser Met Glu Thr Thr Met Arg Ser Pro Val Phe Thr Asp Asn Ser  
1 5 10 15

Thr Pro Pro Ala  
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<210> 114  
<211> 20  
<212> PRT  
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<400> 114

Val Phe Thr Asp Asn Ser Thr Pro Pro Ala Val Pro Gln Thr Phe Gln  
1 5 10 15

Val Ala His Leu  
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<210> 115  
<211> 20  
<212> PRT  
<213> Artificial Sequence

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<400> 115

Val Pro Gln Thr Phe Gln Val Ala His Leu His Ala Pro Thr Gly Ser  
1 5 10 15

Gly Lys Ser Thr  
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<210> 116  
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Substitute\_SequenceListing

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<400> 116

His Ala Pro Thr Gly Ser Gly Lys Ser Thr Lys Val Pro Ala Ala Tyr  
1 5 10 15

Ala Ala Gln Gly  
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<210> 117  
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<212> PRT  
<213> Artificial Sequence

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<223> HCV1238-1257

<400> 117

Lys Val Pro Ala Ala Tyr Ala Ala Gln Gly Tyr Lys Val Leu Val Leu  
1 5 10 15

Asn Pro Ser Val  
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<210> 118  
<211> 20  
<212> PRT  
<213> Artificial Sequence

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<223> HCV1248-1267

<400> 118

Tyr Lys Val Leu Val Leu Asn Pro Ser Val Ala Ala Thr Leu Gly Phe  
1 5 10 15

Gly Val Tyr Met  
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<210> 119  
<211> 20  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> HCV1258-1277

<400> 119

Ala Ala Thr Leu Gly Phe Gly Val Tyr Met Ser Lys Ala His Gly Ile  
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Substitute\_SequenceListing  
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Asp Pro Asn Ile  
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<212> PRT  
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<223> HCV1268-1287

<400> 120

Ser Lys Ala His Gly Ile Asp Pro Asn Ile Arg Thr Gly Val Arg Ala  
1 5 10 15

Ile Thr Thr Gly  
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<210> 121  
<211> 20  
<212> PRT  
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<220>  
<223> HCV1278-1297

<400> 121

Arg Thr Gly Val Arg Ala Ile Thr Thr Gly Ala Pro Ile Thr Tyr Ser  
1 5 10 15

Thr Tyr Gly Lys  
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<210> 122  
<211> 20  
<212> PRT  
<213> Artificial Sequence

<220>  
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<400> 122

His Ser Thr Asp Ser Thr Ser Ile Leu Gly Ile Gly Thr Val Leu Asp  
1 5 10 15

Gln Ala Glu Thr  
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<210> 123  
<211> 20

Substitute\_SequenceListing

<212> PRT  
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<400> 123

Ile Gly Thr Val Leu Asp Gln Ala Glu Thr Ala Gly Ala Arg Leu Val  
1 5 10 15

Val Leu Ala Thr  
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<210> 124  
<211> 20  
<212> PRT  
<213> Artificial Sequence

<220>  
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<400> 124

Ala Thr Pro Pro Gly Ser Val Thr Val Pro His Pro Asn Ile Glu Glu  
1 5 10 15

Val Ala Leu Ser  
20

<210> 125  
<211> 20  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> HCV1358-1377

<400> 125

His Pro Asn Ile Glu Glu Val Ala Leu Ser Asn Thr Gly Glu Ile Pro  
1 5 10 15

Phe Tyr Gly Lys  
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<210> 126  
<211> 20  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> HCV1368-1387

<400> 126

Asn Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala Ile Pro Ile Glu Val  
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Substitute\_SequenceListing  
10 15

Ile Lys Gly Gly  
20

<210> 127  
<211> 20  
<212> PRT  
<213> Artificial Sequence

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<223> HCV1388-1407

<400> 127

Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Ser Asp Glu Leu Ala  
1 5 10 15

Ala Lys Leu Ser  
20

<210> 128  
<211> 20  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> HCV1398-1417

<400> 128

Lys Ser Asp Glu Leu Ala Ala Lys Leu Ser Ala Leu Gly Leu Asn Ala  
1 5 10 15

Val Ala Tyr Tyr  
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<210> 129  
<211> 20  
<212> PRT  
<213> Artificial Sequence

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<400> 129

Ala Leu Gly Leu Asn Ala Val Ala Tyr Tyr Arg Gly Leu Asp Val Ser  
1 5 10 15

Val Ile Pro Thr  
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<210> 130  
<211> 20

Substitute\_SequenceListing

<212> PRT  
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<400> 130

Arg Gly Leu Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val Val Val  
1 5 10 15

Val Ala Thr Asp  
20

<210> 131  
<211> 20  
<212> PRT  
<213> Artificial Sequence

<220>  
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<400> 131

Thr Gln Thr Val Asp Phe Ser Leu Asp Pro Thr Phe Thr Ile Asp Thr  
1 5 10 15

Thr Thr Val Pro  
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<210> 132  
<211> 20  
<212> PRT  
<213> Artificial Sequence

<220>  
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<400> 132

Thr Phe Thr Ile Asp Thr Thr Thr Val Pro Gln Asp Ala Val Ser Arg  
1 5 10 15

Ser Gln Arg Arg  
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<210> 133  
<211> 20  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> HCV1478-1497

<400> 133

Gln Asp Ala Val Ser Arg Ser Gln Arg Arg Gly Arg Thr Gly Arg Gly  
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Substitute\_SequenceListing  
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Arg Arg Gly Ile  
20

<210> 134  
<211> 20  
<212> PRT  
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<220>  
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<400> 134

Gly Arg Thr Gly Arg Gly Arg Arg Gly Ile Tyr Arg Phe Val Thr Pro  
1 5 10 15

Gly Glu Arg Pro  
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<210> 135  
<211> 20  
<212> PRT  
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<223> HCV1498-1517

<400> 135

Tyr Arg Phe Val Thr Pro Gly Glu Arg Pro Ser Gly Met Phe Asp Ser  
1 5 10 15

Ser Val Leu Cys  
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<210> 136  
<211> 20  
<212> PRT  
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<400> 136

Glu Cys Tyr Asp Ala Gly Cys Ala Trp Tyr Glu Leu Thr Pro Ala Glu  
1 5 10 15

Thr Ser Val Arg  
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Substitute\_SequenceListing

<212> PRT  
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<400> 137

Glu Leu Thr Pro Ala Glu Thr Ser Val Arg Leu Arg Ala Tyr Leu Asn  
1 5 10 15

Thr Pro Gly Leu  
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<210> 138  
<211> 20  
<212> PRT  
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<220>  
<223> HCV1538-1557

<400> 138

Leu Arg Ala Tyr Leu Asn Thr Pro Gly Leu Pro Val Cys Gln Asp His  
1 5 10 15

Leu Glu Phe Trp  
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<210> 139  
<211> 20  
<212> PRT  
<213> Artificial Sequence

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<223> HCV1548-1567

<400> 139

Pro Val Cys Gln Asp His Leu Glu Phe Trp Glu Ser Val Phe Thr Gly  
1 5 10 15

Leu Thr His Ile  
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<210> 140  
<211> 20  
<212> PRT  
<213> Artificial Sequence

<220>  
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<400> 140

Glu Ser Val Phe Thr Gly Leu Thr His Ile Asp Ala His Phe Leu Ser  
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Substitute\_SequenceListing  
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Gln Thr Lys Gln  
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<211> 20  
<212> PRT  
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<220>  
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<400> 141

Asp Ala His Phe Leu Ser Gln Thr Lys Gln Ala Gly Asp Asn Phe Pro  
1 5 10 15

Tyr Leu Val Ala  
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<210> 142  
<211> 20  
<212> PRT  
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<220>  
<223> HCV1578-1597

<400> 142

Ala Gly Asp Asn Phe Pro Tyr Leu Val Ala Tyr Gln Ala Thr Val Cys  
1 5 10 15

Ala Arg Ala Gln  
20

<210> 143  
<211> 20  
<212> PRT  
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<400> 143

Tyr Gln Ala Thr Val Cys Ala Arg Ala Gln Ala Pro Pro Pro Ser Trp  
1 5 10 15

Asp Gln Met Trp  
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<210> 144  
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Substitute\_SequenceListing

<212> PRT  
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<400> 144

Ala Pro Pro Pro Ser Trp Asp Gln Met Trp Lys Cys Leu Thr Arg Leu  
1 5 10 15

Lys Pro Thr Leu  
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<210> 145

<211> 20

<212> PRT  
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<223> HCV1608-1627

<400> 145

Lys Cys Leu Thr Arg Leu Lys Pro Thr Leu His Gly Pro Thr Pro Leu  
1 5 10 15

Leu Tyr Arg Leu  
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<210> 146

<211> 20

<212> PRT  
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<223> HCV1618-1637

<400> 146

His Gly Pro Thr Pro Leu Leu Tyr Arg Leu Gly Ala Val Gln Asn Glu  
1 5 10 15

Val Thr Leu Thr  
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<210> 147

<211> 20

<212> PRT  
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<400> 147

Gly Ala Val Gln Asn Glu Val Thr Leu Thr His Pro Val Thr Lys Phe  
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Substitute\_SequenceListing  
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Ile Met Ala Cys  
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<210> 148  
<211> 20  
<212> PRT  
<213> Artificial Sequence

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<400> 148

Ser Gly Ser Trp Leu Arg Asp Val Trp Asp Trp Ile Cys Thr Val Leu  
1 5 10 15

Thr Asp Phe Lys  
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<210> 149  
<211> 20  
<212> PRT  
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<220>  
<223> gHCV-1982

<400> 149

Trp Ile Cys Thr Val Leu Thr Asp Phe Lys Thr Trp Leu Gln Ser Lys  
1 5 10 15

Leu Leu Pro Arg  
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<210> 150  
<211> 20  
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<400> 150

Thr Trp Leu Gln Ser Lys Leu Leu Pro Arg Leu Pro Gly Val Pro Phe  
1 5 10 15

Phe Ser Cys Gln  
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<210> 151  
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Substitute\_SequenceListing

<212> PRT  
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<400> 151

Leu Pro Gly Val Pro Phe Phe Ser Cys Gln Arg Gly Tyr Lys Gly Val  
1 5 10 15

Trp Arg Gly Glu  
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<210> 152  
<211> 20  
<212> PRT  
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<400> 152

Arg Gly Tyr Lys Gly Val Trp Arg Gly Glu Gly Ile Met Gln Thr Thr  
1 5 10 15

Cys Pro Cys Gly  
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<210> 153  
<211> 20  
<212> PRT  
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<400> 153

Gly Ile Met Gln Thr Thr Cys Pro Cys Gly Ala Gln Ile Ala Gly His  
1 5 10 15

Val Lys Asn Gly  
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<210> 154  
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<212> PRT  
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<220>  
<223> gHCV-2042

<400> 154

Ser Met Arg Ile Val Gly Pro Arg Thr Cys Ser Asn Thr Trp His Gly  
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Substitute\_SequenceListing  
10 15

Thr Phe Pro Ile  
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<210> 155  
<211> 20  
<212> PRT  
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<223> gHCV-2052

<400> 155

Ser Asn Thr Trp His Gly Thr Phe Pro Ile Asn Ala Tyr Thr Thr Gly  
1 5 10 15

Pro Cys Ser Pro  
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<210> 156  
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<212> PRT  
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<400> 156

Asn Ala Tyr Thr Thr Gly Pro Cys Ser Pro Ser Pro Ala Pro Asn Tyr  
1 5 10 15

Ser Arg Ala Leu  
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<210> 157  
<211> 20  
<212> PRT  
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<400> 157

Ser Pro Ala Pro Asn Tyr Ser Arg Ala Leu Trp Arg Val Ala Ala Glu  
1 5 10 15

Glu Tyr Val Glu  
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<210> 158  
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Substitute\_SequenceListing

<212> PRT  
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<223> gHCV-2082

<400> 158

Trp Arg Val Ala Ala Glu Glu Tyr Val Glu Val Thr Arg Val Gly Asp  
1 5 10 15

Phe His Tyr Val  
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<210> 159  
<211> 20  
<212> PRT  
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<400> 159

Val Thr Arg Val Gly Asp Phe His Tyr Val Thr Gly Val Thr Thr Asp  
1 5 10 15

Asn Val Lys Cys  
20

<210> 160  
<211> 20  
<212> PRT  
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<223> gHCV-2102

<400> 160

Thr Gly Val Thr Thr Asp Asn Val Lys Cys Pro Cys Gln Val Pro Ala  
1 5 10 15

Pro Glu Phe Phe  
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<210> 161  
<211> 20  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> gHCV-2122

<400> 161

Thr Glu Leu Asp Gly Val Arg Leu His Arg Tyr Ala Pro Ala Cys Lys  
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Substitute\_SequenceListing  
10 15

Pro Leu Leu Arg  
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<210> 162  
<211> 20  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> gHCV-2132

<400> 162

Tyr Ala Pro Ala Cys Lys Pro Leu Leu Arg Asp Glu Val Ser Phe Gln  
1 5 10 15

Val Gly Leu Asn  
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<210> 163  
<211> 20  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> gHCV-2152

<400> 163

Gln Tyr Leu Val Gly Ser Gln Leu Pro Cys Glu Pro Glu Pro Asp Val  
1 5 10 15

Ala Val Leu Thr  
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<210> 164  
<211> 20  
<212> PRT  
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<220>  
<223> gHCV-2162

<400> 164

Glu Pro Glu Pro Asp Val Ala Val Leu Thr Ser Met Leu Thr Asp Pro  
1 5 10 15

Ser His Ile Thr  
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<210> 165  
<211> 20

Substitute\_SequenceListing

<212> PRT  
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<220>  
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<400> 165

Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu Thr Ala Lys Arg  
1 5 10 15

Arg Leu Ala Arg  
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<210> 166  
<211> 20  
<212> PRT  
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<220>  
<223> gHCV-2182

<400> 166

Ala Glu Thr Ala Lys Arg Arg Leu Ala Arg Gly Ser Pro Pro Ser Leu  
1 5 10 15

Ala Ser Ser Ser  
20

<210> 167  
<211> 20  
<212> PRT  
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<220>  
<223> gHCV-2192

<400> 167

Gly Ser Pro Pro Ser Leu Ala Ser Ser Ser Ala Ser Gln Leu Ser Ala  
1 5 10 15

Pro Ser Leu Lys  
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<210> 168  
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<212> PRT  
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<220>  
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<400> 168

Ala Ser Gln Leu Ser Ala Pro Ser Leu Lys Ala Thr Cys Thr Ile His  
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Substitute\_SequenceListing  
10 15

His Asp Ser Pro  
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<210> 169  
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<212> PRT  
<213> Artificial Sequence

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<400> 169

Ala Thr Cys Thr Ile His His Asp Ser Pro Asp Ala Asp Leu Ile Glu  
1 5 10 15

Ala Asn Leu Leu  
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<210> 170  
<211> 20  
<212> PRT  
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<220>  
<223> gHCV-2222

<400> 170

Asp Ala Asp Leu Ile Glu Ala Asn Leu Leu Trp Arg Gln Glu Met Gly  
1 5 10 15

Gly Asn Ile Thr  
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<210> 171  
<211> 20  
<212> PRT  
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<220>  
<223> gHCV-2232

<400> 171

Trp Arg Gln Glu Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn  
1 5 10 15

Lys Val Val Ile  
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<210> 172  
<211> 20

Substitute\_SequenceListing

<212> PRT  
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<220>  
<223> gHCV-2242

<400> 172

Arg Val Glu Ser Glu Asn Lys Val Val Ile Leu Asp Ser Phe Glu Pro  
1 5 10 15

Ile Arg Ala Glu  
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<210> 173  
<211> 20  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> gHCV-2252

<400> 173

Leu Asp Ser Phe Glu Pro Ile Arg Ala Glu Glu Asp Glu Arg Glu Val  
1 5 10 15

Ser Val Pro Ala  
20

<210> 174  
<211> 20  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> gHCV-2262

<400> 174

Glu Asp Glu Arg Glu Val Ser Val Pro Ala Glu Ile Leu Arg Arg Ser  
1 5 10 15

Arg Lys Phe Pro  
20

<210> 175  
<211> 20  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> gHCV-2272

<400> 175

Glu Ile Leu Arg Arg Ser Arg Lys Phe Pro Ala Ala Met Pro Ile Trp  
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Substitute\_SequenceListing  
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Ala Arg Pro Asp  
20

<210> 176  
<211> 20  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> gHCV-2292

<400> 176

Tyr Asn Pro Pro Leu Leu Glu Ser Trp Lys Asp Pro Asp Tyr Val Pro  
1 5 10 15

Pro Val Val His  
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<210> 177  
<211> 20  
<212> PRT  
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<220>  
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<400> 177

Asp Pro Asp Tyr Val Pro Pro Val Val His Gly Cys Pro Leu Pro Pro  
1 5 10 15

Thr Lys Ala Ala  
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<210> 178  
<211> 20  
<212> PRT  
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<400> 178

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Thr Val Ser Ser  
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Substitute\_SequenceListing

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Thr Lys Thr Phe  
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Ala Ala Asp Ser  
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Pro Asp Gln Thr  
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Ser Asp Asp Gly Asp Lys Glu Ser Asp Val Glu Ser Tyr Ser Ser Met  
Page 54

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Pro Pro Leu Glu  
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Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu Gly Glu Pro Gly Asp Pro  
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Asp Leu Ser Asp  
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Gly Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val  
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Ser Glu Glu Ala  
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